Pegfilgrastim vs. filgrastim for supportive care after autologous stem cell transplantation: can we decide?

Ziakas PD, Kourbeti IS

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The study evaluated the clinical and economic impact of pegfilgrastim versus filgrastim (growth factors) for supportive care of patients receiving autologous haematopoietic stem cell transplantation to ensure faster neutrophil (white blood cell) recovery and lower febrile neutropenia incidence. Both drugs appeared to be equally effective, although there were significant cost-savings with filgrastim. The analysis was based on a simple decision-analytic framework and used transparent methods to assess the comparative clinical impact of the two drugs. The authors’ conclusions appear valid.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The study evaluated the clinical and economic impact of pegfilgrastim compared with filgrastim (growth factors) for supportive care of patients receiving autologous haematopoietic stem cell transplantation to ensure faster neutrophil (white blood cell) recovery and lower incidence of febrile neutropenia.

Interventions
Pegfilgrastim was compared with filgrastim after autologous haematopoietic stem cell transplantation. It was assumed that filgrastim or pegfilgrastim injections occurred on day one of stem cell infusion and that a second injection of pegfilgrastim was required on day 14 or pegfilgrastim patients could be switched to daily filgrastim.

Location/setting
Greece/Secondary care.

Methods
Analytical approach:
The analysis was based on a cost-effectiveness framework in a hypothetical cohort of patients. A short time horizon was considered in the analysis, corresponding to the duration of treatment. The perspective adopted in the study was not explicitly stated.

Effectiveness data:
MEDLINE, EMBASE and Cochrane Central Register of Controlled Trials (CENTRAL) databases were searched to identify relevant sources of data. Search criteria included randomised controlled trials (RCTs), case-control studies, and studies with a historical control group for filgrastim. Studies were reviewed independently by two authors. The evidence retrieved from the literature was synthesised in a meta-analysis. Twelve studies were identified including four RCTs, two non-randomised prospective studies and six retrospective reviews. A quality assessment of each study was made. The main endpoints of the analysis were time to absolute neutrophil count recovery, febrile neutropenia, and length of hospital stay.

Monetary benefit and utility valuations:
Not considered.

Measure of benefit:
No summary benefit measure was used as a cost-consequences analysis appeared to have been conducted. The main
Endpoints of the clinical analysis were time to absolute neutrophil count recovery, febrile neutropenia, and length of hospital stay.

Cost data:
The costs were restricted to injections of pegfilgrastim and filgrastim. Unit costs were provided by the Hellenic General Secretariat of Commerce. Quantities of resources used were based on conventional dosages. Costs were in Euros (EUR). The price year was 2011.

Analysis of uncertainty:
A deterministic sensitivity analysis was carried out to consider variations in the duration and price of treatment.

Results
There was reduction in the mean difference in days to absolute neutrophil count recovery of -0.82 (95% CI -1.07 to -0.57) with pegfilgrastim compared to filgrastim. Duration of febrile neutropenia was also shorter with pegfilgrastim (mean difference -0.67, 95% CI -1.28 to -0.06). No statistically significant differences were observed for the risk of febrile neutropenia or the length of hospital stay.

The total costs per treated patient were EUR 778.18 with pegfilgrastim and EUR 661.20 with filgrastim; the difference of EUR 116.97 was statistically significant (p<0.001). A drop in the price of pegfilgrastim made this strategy cheaper.

Authors' conclusions
The authors concluded that both drugs appeared to be at least equally effective, although significant cost-savings were associated with filgrastim.

CRD commentary
Interventions:
The two interventions compared were the standard options for the patient population selected and were also relevant in other settings.

Effectiveness/benefits:
Appropriate databases were searched to identify relevant sources of evidence. The key methods and conduct of the systematic review were clearly explained. Details of the meta-analytic approach used to combine data found in the literature were provided. Several statistical analyses were conducted to deal with heterogeneity of studies and potential biases. Key information about the methodological features of the studies included in the meta-analysis was appropriately provided. A quality assessment was also conducted and results for the RCTs were highlighted. The authors noted that retrospective studies showed no statistically significant differences in any outcome between the two drugs compared.

Costs:
Although not explicitly stated, the perspective of the hospital appeared to have been adopted, as only drug costs administered during the hospital stay were considered; these costs were based on nosocomial prices, further supporting the viewpoint of the hospital. The price year was reported, so reflation exercises in other periods of time would be possible. Appropriate tests were carried out to investigate the statistical significance of cost differences. The impact of variations in cost estimates was taken into account in the sensitivity analyses. The authors stated that costs were driven mainly by drug prices given the lack of statistically significant differences in length of hospital stay between treatment groups.

Analysis and results:
Costs and benefits of the two strategies were not synthesised because of the cost-consequences design of the analysis. Uncertainty was investigated considering the variability in clinical data extracted from the literature using two different meta-analytic approaches. Simple variations in the cost of drugs were used to assess the robustness of estimated total costs. The results were extensively presented. The authors stated that the advantage of pegfilgrastim compared with filgrastim for a reduced number of infusions and its potential impact on quality of life and convenience to patients was not considered in the study. These findings were specific to the Greek context, but might be similar in settings with the same relative drug prices.
Concluding remarks:
The analysis was based on a simple decision-analytic framework and used transparent methods to assess the comparative clinical impact of the two strategies. The authors' conclusions appear valid.

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